

Title: A Geology Sampling System for Microgravity Bodies

Abstract

Human exploration of microgravity bodies is being investigated as a precursor to a Mars surface mission. Asteroids, comets, dwarf planets, and the moons of Mars all fall into this microgravity category and some have been discussed as potential mission targets. Obtaining geological samples for return to Earth will be a major objective for any mission to a microgravity body. Currently the knowledge base for geology sampling in microgravity is in its infancy. Humans interacting with non-engineered surfaces in microgravity environment pose unique challenges. In preparation for such missions a team at the NASA Johnson Space Center has been working to gain experience on how to safely obtain numerous sample types in such an environment. This paper describes the type of samples the science community is interested in, highlights notable prototype work, and discusses an integrated geology sampling solution.